Analysis of otter (*Lutra lutra*) diet from spraints collected in Cork city and harbour in 2021.

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Background

In July 2022 Cork Nature Network (now Nature Network Ireland) engaged Munster Technological University (MTU) to conduct diet analysis of Eurasian otters *(Lutra lutra)* from spraints (faeces) collected from Cork city and harbour during 2021.

Methods

Methods followed those described in (Conroy, 2005). Spraints were defrosted and soaked in a solution of water and a cleaning agent *(Steradent* tablets) to remove any mucilaginous material and soil particles. Samples were left overnight, rinsed using a 0.5 mL mesh sieve, then air dried before identification of material.

Specimens occurring in samples were identified to the lowest taxonomic level possible. Conroy et al. (2005) was used to identify fish taxa from scales, jaw bones and vertebrae. Other taxa e.g. mammal and insect groups were identified by consultation with group experts. Crustaceans were confirmed by consulting with Dr. Ross Macklin on what species of crustaceans have been found in the corresponding waterways where the spraints were taken from.

Results

Diet composition

A total of 141 spraints were analysed, two of which did not contain any material that was identifiable. Of the 139 samples that contained usable material, 16 taxa were identified. Of these, 7 were fish species, 3 were molluscs (2 gastropods and 1 bivalve), 2 were beetles (coleoptera), and 1 was an insect (diptera). One mammal *(Apodemus sylvaticus)* was also recorded. Two spraints contained 4 prey species, 12 contained at least 3, and the remainder contained 3 or less.

The three most frequent taxa by percentage occurrence were *Salmo* sp. (63.8%), crustaceans (24.8%) and stickleback *(Gasterosteus* sp.) (23.4%). European eel *(Anguilla anguilla)* occurred in 6.4% of the spraints. Other fish species included

European perch (*Perca fluviatilis*), flounder (*Microstomus* sp.), common dab (*Limanda limanda*) and rockling (*Gaidropsarus* sp.). Limpet and a snail species (gastropoda) and mussels (*Mytilus edulis*) occurred once each, as did the remaining invertebrate taxa: *Hydropsyche* sp. (caddisfly), *Helophorus brevipalpis* (beetle). Bird feathers occurred in 9 of the spraints, but could not be identified further.

Table 1 Frequency and percentage frequency of prey items in 139 otter spraints from Cork city and harbour

Taxon	Group	Frequency	Percentage Freq.
Salmo sp. (salmonid)	fish	90	63.8
Crustacea	crustacean	35	24.8
Gasterosteus sp. (stickleback)	fish	33	23.4
Anguilla anguilla (European eel)	fish	9	6.4
Aves (bird)	bird	9	6.4
Perca fluviatilis (European perch)	fish	5	3.5
Coleoptera sp. (beetle)	beetle	3	2.1
Microstomus sp. (flounder)	fish	2	1.4
Limanda limanda (common dab)	Fish	2	1.4
Gaidropsarus sp. (rockling)	Fish	2	1.4
Gastropoda sp. (snail)	gastropod	2	1.4
Patella sp. (limpet)	gastropod	1	0.7
Mytilus edulis (mussel)	bivalve	1	0.7
Hydropsyche sp. (caddisfly)	insect	1	0.7
Helophorus brevipalpis (beetle)	beetle	1	0.7
Apodemus sylvaticus (wood mouse)	mammal	1	0.7

Diet by location

Figure 1 shows the percentage frequency of prey items for 10 of the sites sampled. Prey items that occurred in less than 5 spraints were removed and only sites that had more than two prey taxa were included. Tramore and Two Pot had 5 taxa recoded at each. Four prey taxa were recorded from East Ferry and FOTA, while Douglas, the Lee and Kingsly bridge had 3 taxa present. The site at Glasheen had two taxa recorded (stickleback and salmonid), while Roches point and Curraheen only had one each (crustacean and salmonid respectively).

The only mammal species (wood mouse) was identified from a jaw bone with two molar teeth, and probably recorded at Roches point or East ferry ("*east on steps @*

lighthouse sea" was written on sample and there was no other information in GIS data).

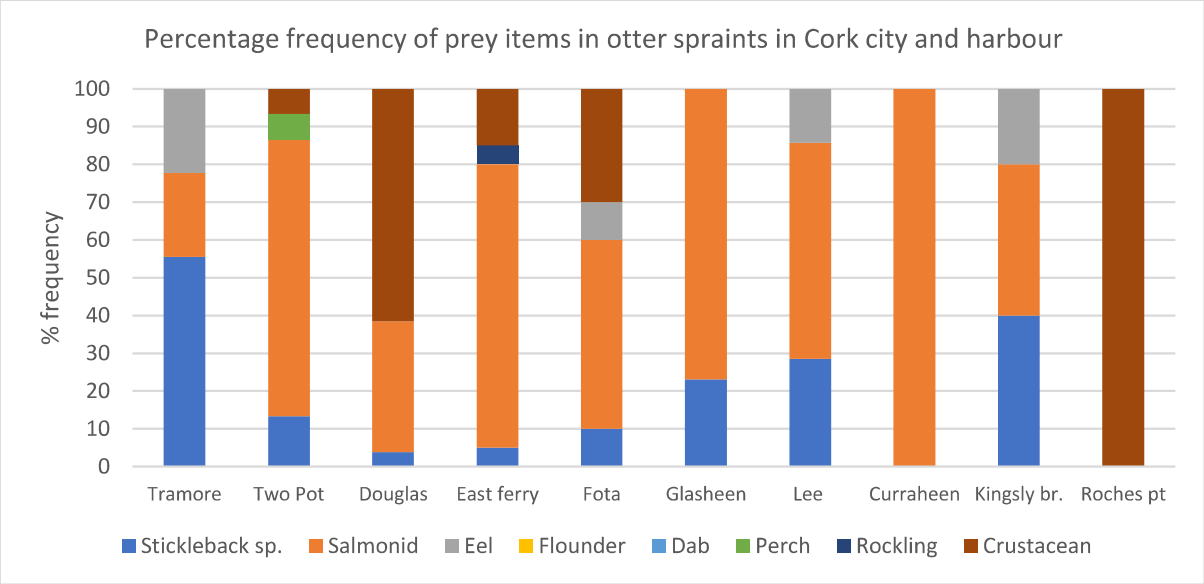
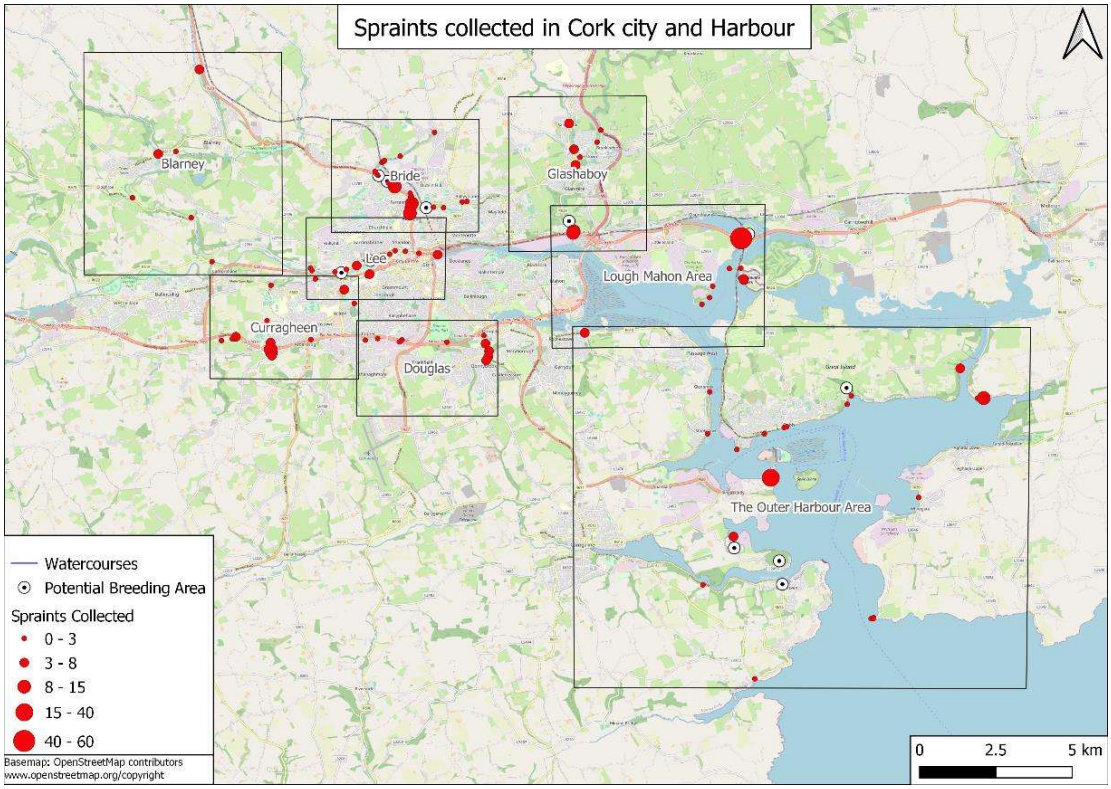
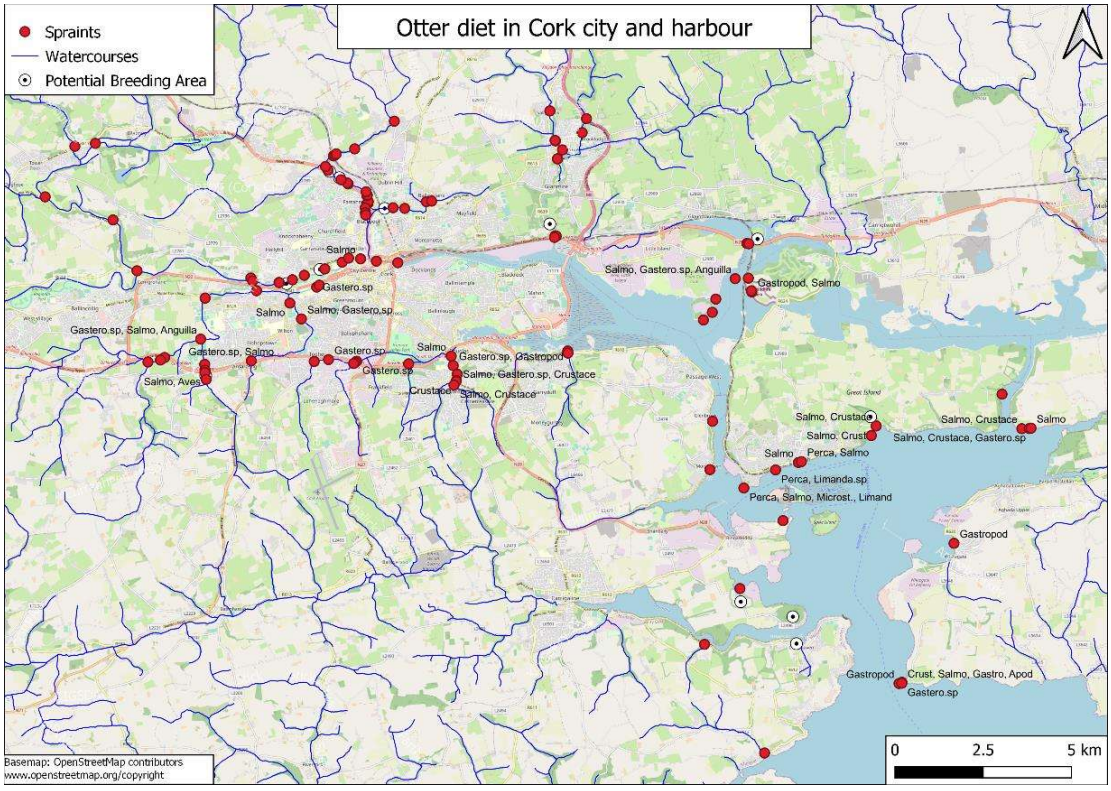


Figure 1 Percentage frequency of prey items in otter spraints in Cork city and harbour

Maps



Map 1: Spraints collected from Cork harbour otter study area.



Map 2: Spraint collection points and prey items.
Crust = crustacean, Gastro = Gastropod, Apod = *Apodemus sylvaticus* (wood mouse), Perca = *Perca fluviatilis*, Salmo = salmonid sp., Gastero = *Gasterosteus* sp. (stickleback), Anguilla = *Anguilla anguilla* (European eel), Limand = *Limanda limanda* (Common dab), *Microst* = *Microstomus sp.* (sole)

Comments

As may be expected, salmonid ('Salmo' on the maps) and stickleback ('Gastero.sp' on the maps) prey items dominate in the upper sections of each catchment, along with eels ('Anguilla'). Crustaceans ('Crustace'), gastropods and marine fish i.e. sole and dab occur in the outer harbour. The presence of perch ('Perca' on the maps) around a small area of Cobh was unexpected, given it is a freshwater species. The occurrence of beetles and caddisfly species in the spraints may be due to their presence in the fish consumed by the otters.

Acknowledgements

Hugh Patrick O' Connor completed all the identification under the supervision of Dr Peter Stuart and Dr Kilian Kelly. Thanks to Andrew McManus (MTU PhD candidate) for support in the laboratory. Dr Deborah McCormick identified the aquatic invertebrates.

References

Conroy, J.W.H., Watt, J.,. Webb, J.B.,. Jones, A., 2005. *A guide to the identification of prey remains in otter spraint*. London: The Mammal Society.